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COMPARATIVE STUDY OF CONSUMERS' KNOWLEDGE AND ATTITUDES TOWARDS FOOD SAFETY AND PURCHASE INTENTION OF NIGHT MARKET FOODS CONTAINING POULTRY IN LOW AND HIGH FOOD POISONING CASES STATES

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ABSTRACT

This study was conducted to compare the level of consumers' knowledge and attitude towards food safety as well as consumers' intention to purchase night market food precisely food containing poultry based on food hygiene practice of food handlers in two different states *i.e.* Selangor and Kuala Lumpur. Selangor represents a state with high food poisoning cases while Kuala Lumpur has low food poisoning cases. Two hundred night market consumers for each sampling location were approached. Data was statistically analyzed using SPSS program version 20.0. Generally, respondents' knowledge of food safety score was significantly different for consumers in Kuala Lumpur (M=14.37, SD=3.75) and Selangor (M=15.10, SD=3.36), (t=2.107, df=429) at $p<0.05$. Analysis also showed that there were significant differences in the attitude score among consumers in Kuala Lumpur (M=4.71, SD=0.39) and Selangor (M=4.48, SD=0.28), (t=7.085, df=414) at $p<0.05$. Results revealed that consumers' intention to purchase night market food in Selangor and Kuala Lumpur are statistically different depending on food handlers' practices (*e.g.* tasting food using fingers and hand palm, wear nail polish, touch cooked food with bare hands and etc.) This empirical study served status of consumers' knowledge, attitude and intention to purchase regarding food safety which could be applied to implement repeated food safety education programs to improve quality of life in local communities.

Key words: Food safety, knowledge, attitude, hygiene practice of food handlers

INTRODUCTION

Eating out has become part of the living lifestyle of people (Koo *et al.,* 1999). The increase of eating-out population has contributed to the diversification of Malaysian foodservice sector. According to USDA, there are 19% of food caterers, 8% of full-service restaurants, 3% of fast food restaurants and 70% of other foodservice industries that made up the structure of Malaysian foodservice sector which consists of small-to-medium operators such as coffee shops, open air food stalls, food court, pub and bars. Therefore, consumers in Malaysia have plenty of choices to choose where to eat, regarding their personal preferences and needs, including street stalls or kiosks (Euromonitor, 2013).

Malaysians are cautious over their spending due to rising cost of living and food prices (Euromonitor, 2013). This is the time where night market comes into consideration. Night market is convenient for consumers to visit as they can find either food or non-food items there. It has been reported that the purpose for visitors going to night market were mostly for food (Chang & Hsieh, 2006); possibly due to night market foods are tasty, convenience, have varieties and sold at low price. Doing business at night market requires small amount of investment (*i.e.* rental is very low). In addition, special fund (*i.e. Skim Usahawan Pasar Malam*) amounted 100 million Ringgit is allocated to help entrepreneurs

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to start up business at night market (Utusan Malaysia, 2014). Therefore, the growth of night markets happens rapidly. However, night market seems to have limited practices on food safety and hygiene aspect, which lead to the occurrence of food poisoning outbreak.

There were deaths caused by food poisoning from night markets almost every year and most of them involved consumption of *Salmonella*-contaminated food. In 2011, 11 years old girl was found sprawled in the bathroom with foaming mouth and swollen eyes 30 minutes after consuming the *otak-otak* and ABC (*ais batu campur*) purchased from a *Bazzar Ramadhan* in Selangor. Her entire family was admitted at the hospital (Norrasyidah, 2011). In 2012, a case of 25 people had food poisoning after they ate *Nasi Lemak* and *Murtabak* from a night market in Johor is reported in The Star Online (Anonymous, 2011). A student at the age of 7 was dead in that incidence while her family was hospitalized at Putra Hospital in Batu Pahat. In year 2014, a 5 years old boy died as resulted from *Salmonella* poisoning and 68 people seek for treatment due to food poisoning in Kuala Terengganu. These victims had eaten food bought from night markets in two different night markets. Lab test has proven that these victims were infected with *Salmonella*. Three night market traders who were believed to sell *Salmonella*-contaminated food were asked to shut down their business for a week to do the cleaning process (Che, 2014). This could happened due to foods which are exposed up to 8 hours could lead to food being held for long hours at temperature danger zone (40–140°F) (Sun *et al.,* 2012) and this would in turn becomes favourable condition for food-borne pathogen growth especially *Salmonella*. For that reason, consumers' knowledge and attitudes towards food safety and intention to purchase food based on food handlers' hygiene practices in this present study will concentrate on foods containing poultry sell in night market.

It is necessary to understand the KAP of both parties so that the food poisoning outbreaks can be reduced to the very minimum level. This research is therefore conducted to investigate consumers' level of food safety knowledge (K) and attitudes (A). In addition, their intention to purchase night market food based on food hygiene practice (P) of food handlers in both rural and urban area was investigated. This present study concentrates on understanding the KAP of food safety only among consumers of night market foods because people tend to express optimistic bias toward food risks, underestimating or ignoring risks of encountering harmful effects from foods (Griffith & Redmond, 2004). Consumers, who tend to repurchase at the same stall may have some trust of the seller thus they tend to compensate the knowledge of food risks (Frewer *et al.,* 2003). These studies indicated that food risks are dealt by the consumers with variety of strategies. This situation is very likely to happen in Malaysia, where people tend to focus less on food safety aspect in night markets than restaurants because it is understandable that food safety is difficult to be practiced at street level. This is because the facilities, food preparation area, access to potable water and space of washing were limited in night markets (Huang *et al.,* 2011).

Previous KAP studies among consumers revealed various results. Pannu *et al*. (2016) conducted survey to 500 consumers of street foods in Delhi, India found 26% respondents have good knowledge about issues related to food safety while 45.8% were categorized in average knowledge category and 28% had poor knowledge. In precise, Pannu *et al*. (2016) revealed that knowledge regarding the importance of washing hands before eating (80.4%) and the need for using clean utensils (77%) were acknowledged across street food consumers in West, South and Central zones of Delhi city. However, knowledge regarding raw and cooked foods should be kept separately was low (38%) and this aspect significantly differ for South and West consumers. In terms of factors affecting consumers' consumed street foods, 81% chose street foods due to taste followed by variety of menu (31%) and reasonable price (28%). Only 10% respondents showed concerns about safety of street food.

In another study, Asiegbu *et al.* (2016) carried out a survey to consumers ready-to-eat street-vended foods in Johannesburg, South Africa. Results revealed that majority of respondents aware that certain food borne bacteria can cause fatal disease. Yet, over 70% of them have never heard about *Salmonella* spp. *E. coli*, *Listeria monocytogenes* and *Campylobacter jejuni*. Some consumers hesitate about the safety of street vended foods but it did not prevent them from consuming.

Research regarding knowledge, attitude and practice (KAP) of food safety among both food handlers and consumers in Malaysian night market is still limited. This comparison was made since statistics shows a huge difference in food poisoning cases in both regions, even both areas are close to each other.

The highest food poisoning cases were recorded in Selangor (2550) while the lowest was in Perlis with only 147 cases. Due to convenience factors, this study chose Kuala Lumpur with 164 food poisoning cases as another sampling location with low food poisoning cases. It is anticipated that this study may revealed some differences in how consumers in both areas differ in terms of knowledge and attitude towards food safety and their intention to purchase night market food based on food handlers' hygiene practice in night market.

On that basis, the present study is aimed to investigate to what extent the consumers of night markets in Kuala Lumpur and Selangor differ in their awareness and understanding of food safety and their attitudes towards food safety. In addition, their intention to purchase night market foods based on food handlers' hygiene practices in night market are also compared.

MATERIALS AND METHODS

There were a total of 97 night markets in Kuala Lumpur, which registered with Kuala Lumpur City Hall (DBKL). These locations were categorized into 11 parliamentary constituencies which are Batu, Wangsa Maju, Cheras, Lembah Pantai, Segambut, Bandar TunRazak, Setiawangsa, Titiwangsa, Bukit Bintang, Seputeh and Kepong (DBKL, 2014). The night markets that have been proven to be largest in each constituency by the government and mass media were Taman Melati, Taman Connaught, Bangsar Baru, Bandar Tun Razak and Lorong Tunku Abdul Rahman (Farhana, 2013). Due to large area of Selangor, data collection was focused in 8 out of 24 night markets in Shah Alam.

In this research, purposive sampling technique was chosen to achieve representativeness. The largest night market in each constituency in Kuala Lumpur and Selangor was chosen because it has the highest number of visitors. Convenience sampling is used to select sample for this study. In order to meet the research objective, participants were selected according to the inclusive criteria i.e. either men or women who purchased poultry-containing food products from night market. This is because *Salmonellosis* was found to be common in Malaysia and most of the food poisoning cases was caused by the presence of poultry in a dish (Che, 2014); (Chai *et al.,* 2011); (Abdul Hamid *et al.,* 1995).

Questionnaire was used as the research instrument in this research. It was made up by four sections, which were socio demographic profiles, food safety knowledge, food safety attitudes and food safety practices. Socio-demographic profile questions were adopted from Chinna *et al.* (2012). Questions asked in the session of food safety knowledge and attitudes were adapted and modified from Ellayne *et al.* (2012). For the section of food safety knowledge, one mark was given for each questions which were correctly answered and zero mark was given to those that was answered wrongly (Cuprasitrut *et al.,* 2011). Mark allocation for section regarding consumers' intention to purchase based on food handlers' hygiene practices use similar method. There were a total of 25 questions in the section of food safety knowledge and 17 questions regarding food hygiene practices of food handlers. Therefore, the score range was between 0 and 25 for knowledge score and 0 to 17 scored for food hygiene practices of food handlers. These scores were converted to 100 points and the score below 50% of food safety knowledge questionnaire is defined as poor knowledge (Nee & Sani, 2011). 5-point Likert scale was adapted to measure 13 questions regarding consumers' attitudes towards food safety where 1=strongly disagree and 5=strongly agree. Attitude level was classified into poor and good where poor attitude level is determined when rating for attitude statements is below 4 and good attitude level is more than 4.

The measurement items were subjected to validity and reliability test for questionnaire section that applies continuous scale *i.e.* consumers' food safety attitudes. Convergence validity is used in assessing the extent of the items intended to measure the same construct are highly correlated. The convergence validity of the items analysed was not achieved. On the other hand, cronbach alpha value was less than 0.70 (Bowling, 1997). Therefore, the items for this particular section were rephrased.

Data obtained in this research was analysed using the Statistical Package for the Social Sciences (SPSS) version 20. Descriptive statistical analysis (including frequency, mean and standard deviation) and inferential statistical analysis (including compare mean between variables and Chi-Square) were examined in this research.

RESULTS AND DISCUSSION

Socio-demographic profiles of respondents

The respondents involved in this study were the consumers who had experience purchasing poultry-containing food products from the night markets in Kuala Lumpur and Selangor. Table 1 shows the socio-demographic profiles of the respondents by frequency and percentage.

The total number of respondents in this study are 431 in which the respondents in Kuala Lumpur (n=231) are more than Selangor (n=200). Over 70 percent of respondents are female in both areas. The highest proportion of responses is collected from respondents who aged 20-29 years old and have tertiary education in both areas. In terms of occupation, top three job scope of respondents in Kuala Lumpur is services, management and business. On the other hand, majority respondents in Selangor work in the area of clerical, services and supervisory. Higher proportion of respondents from Selangor compared to Kuala Lumpur has an income of RM1500 and more. This result however should be treated cautiously due to low response rate (only 60.2%) regarding income was recorded for respondents in Kuala Lumpur.

Table 1. Socio-demographic profiles of the respondents

Demographic characteristic	Frequency (percentage)	
	Kuala Lumpur (n=231)	Selangor (n=200)
Gender		
Male	64 (27.7)	52 (26.0)
Female	167 (72.3)	148 (74.0)
Ethnicity		
Malay	93 (40.3)	200 (100)
Chinese	108 (46.8)	
Indian	28 (12.1)	
Others	2 (0.9)	
Age		
20–29 years old	88 (38.1)	105 (52.5)
30–39 years old	76 (32.9)	65 (32.5)
40–49 years old	41 (17.7)	30 (15.5)
Education		
Secondary education	57 (24.7)	74 (37.0)
Post-secondary	48 (20.8)	44 (22.0)
Tertiary education	124 (53.7)	83 (41.0)
Occupation		
Management	33 (14.3)	10 (5.0)
Academic	8 (3.5)	16 (8.0)
Businessman	26 (11.3)	12 (6.0)
Supervisor	13 (5.6)	26 (13.0)
Clerical	10 (4.3)	60 (30.0)
Manual	9 (3.9)	13 (6.5)
Service	38 (16.5)	41 (20.5)
Homemaker	3 (1.3)	4 (2.0)
Student	17 (7.4)	18 (9.0)
Income*		
< RM 1500	82 (35.5)	64 (32.0)
RM 1500- RM 3000	57 (24.7)	136 (68.0)
Frequency of visiting night market		
Once a month	97 (42.0)	72 (36.0)
Twice a month	99 (42.9)	91 (45.5)
3 to 4 times a month	35 (15.2)	37 (18.5)
Formal education regarding food safety		
Yes	48 (20.8)	101 (50.5)
No	183 (79.2)	99 (49.5)
Type education		
Attended class	24 (10.4)	20 (20.4)
Training	24 (10.4)	78 (79.6)
Information food safety		
Newspaper	99 (42.9)	24 (12.0)
Television	16 (6.9)	29 (14.5)
Article from Malaysia Ministry of Health	91 (39.4)	147 (73.5)

*Income has been re-classified based on actual data.

Table 1 also shows that higher percentage of respondents from both areas frequent night market once or twice a month. More respondents in Kuala Lumpur have no formal education regarding food safety (79%). On the other hand, there is equal amount of respondents who have and do not have formal education regarding food safety in Selangor. Among those who have formal education regarding food safety, half of them in Kuala Lumpur only attended classes while another half have gone through training. In Selangor, more respondents have attended training than classes to obtain formal education in food safety.

The reliable source for Kuala Lumpur' respondents to obtain information about food safety are the newspaper (42.9%) and article from Malaysia Ministry of Health (39.4%). Respondents in Selangor clearly rated the most reliable source is article from Malaysia Ministry of Health. It indicates that consumers tend to believe and trust the information published by the mass media and authorities. Hence, mass media should be responsible

to publish valid information to the public in order to educate them. Besides, consumers are also aware of the creditable site which believes should provide the most trustworthy information.

Comparison of consumers' knowledge of food safety in Kuala Lumpur and Selangor

In order to identify consumers' level of food safety knowledge and consumers' intention to purchase based on food handlers' hygiene practices, scores of each respondent was calculated for each section. Table 2 shows the comparison of respondents' scores for food safety knowledge in Kuala Lumpur and Selangor.

Table 2 indicates significant association between location of study and consumers' level of food safety knowledge ($p<0.05$). Consumers in Kuala Lumpur have good level of food safety knowledge compared to consumers in Selangor. Further analysis to compare mean difference of food safety knowledge between two areas revealed that there was a significant difference in the scores for food safety knowledge among consumers in Kuala Lumpur (M=14.37, SD=3.75) and Selangor (M=15.10, SD=3.36), ($t=2.107$, $df=429$) at $p<0.05$. This could reflect why Kuala Lumpur becomes second lowest city of incidence rate for food poisoning in Malaysia (Department of Statistics Malaysia, 2015). Demographic data in this study on educational background (refer Table 1) also justified this outcome whereby large proportion of respondents in Kuala Lumpur have tertiary education (53.7%) compared to lower educational level hold by respondents in Selangor (59%). A look into each element of food safety knowledge found almost similar responses among both respondents in Kuala Lumpur and Selangor as in Table 3.

Table 2. Consumers' Level of Food Safety Knowledge in Kuala Lumpur (n=231) and Selangor (n=200)

Consumers' Level of Food Safety Knowledge	Kuala Lumpur Count (%)	Selangor Count (%)	p value
Poor (≤12.5 score)	77 (33.3)	165 (82.5)	0.000*
Good (>12.5 score)	154 (66.7)	35 (17.5)	

*pearson chi square

Table 3. Frequency and Percentage of Answers for Food Safety Knowledge

No.	Items	Kuala Lumpur		Selangor	
		Correct, n (%)	*Wrong, n (%)	Correct, n (%)	*Wrong, n (%)
1	Wear Gloves	227 (98.3)	4 (1.7)	200 (100)	0
2	Washing Hands	225 (97.4)	6 (2.6)	185 (92.5)	15 (7.5)
3	Leave from Work	215 (93.1)	16 (6.9)	185 (92.5)	15 (7.5)
4	Cross Contamination	212 (91.8)	19 (8.2)	184 (92.0)	16 (8)
5	Contaminated Food	205 (88.7)	26 (11.3)	177 (88.5)	23(11.5)
6	Proper Cleaning	185 (80.1)	46 (19.9)	168 (84.0)	32 (16)
7	AIDS	179 (77.5)	52 (22.5)	158 (79.0)	42 (21)
8	Detergent Usage	173 (74.9)	58 (25.1)	121 (60.5)	79 (39.5)
9	Clean and Sanitation	151 (65.4)	80 (34.6)	113 (56.5)	87 (43.5)
10	Diarrhea	147 (63.6)	84 (36.4)	100 (50.0)	100 (50)
11	Miscarriages	139 (60.2)	92 (39.8)	101 (50.5)	99 (49.5)
12	Eat and Drink	134 (58.0)	97 (42.0)	86 (43.0)	114 (57)
13	Clostridium	123 (53.2)	108 (46.8)	84 (42.0)	116 (58)
14	Typhoid Fever	112 (48.5)	119 (51.5)	84 (42.0)	116 (58)
15	Advance Preparation	108 (46.8)	123 (53.2)	83 (41.5)	117 (58.5)
16	Microbes	104 (45.0)	127 (55.0)	82 (41.0)	118 (59)
17	Raw Food	104 (45.0)	127 (55.0)	63 (31.5)	137 (68.5)
18	Reheating Food	97 (42.0)	134 (58.0)	56 (28.0)	144 (72)
19	Freezing can Kills	96 (41.6)	135 (58.4)	45 (22.5)	155 (77.5)
20	Salmonella	92 (39.8)	139 (60.2)	44 (22.0)	156 (78)
21	High Risk population for Food Poisoning	92 (39.8)	139 (60.2)	27 (13.5)	173 (86.5)
22	Hepatitis A	73 (31.6)	158 (68.4)	26 (13.0)	174 (87)
23	Staphylococcus	56 (24.2)	175 (75.8)	22 (11.0)	178 (89)
24	Correct temperature for Ready to Eat Food	30 (13.0)	201 (87.0)	22 (11.0)	178 (89)
25	Correct temperature for Perishable Food	26 (11.3)	205 (88.7)	21 (14.5)	179 (89.5)

*Note: Wrong answer was the answers that are given zero mark, including the answer of 'Not Sure'.

In Table 3, 50% and more respondents in Kuala Lumpur and Selangor answered correctly for items 1 to 13 and items 1 to 11 respectively. It indicates that consumers are aware of the fact (1) using gloves while handling food reduces the risk of food contamination, (2) washing hands before handling food reduces the risk of food contamination, (3) during infectious disease of the skin, (4) it is necessary for the food handlers to take leave from work, (5) cross contamination happens when microorganisms from a contaminated food are transferred by the food handler's hands or kitchen utensils to another food, (6) contaminated foods always have some change in colour, odour or taste, (7) proper cleaning and sanitization of utensils decrease the risk of food contamination, (8) AIDS cannot be transmitted by food, (9) washing utensils with detergent leaves them free of contamination, (10) clean is not the same as sanitization, (11) bloody diarrhoea can be transmitted by food and (12) miscarriages in pregnant women can be induced by food-borne disease.

The above mentioned matters mostly related to food handlers' hygiene practices which are known subjects or issues frequently mentioned in health campaign or press statements made by Ministry of Health (MOH). For instance, on 10th June 2016 in Utusan Malaysia, Datuk Seri Dr. Hilmi Yahya (Deputy Minister of Health) has clearly advised consumers to observe the hygiene practice of food handlers before buying foods due to concern of food-borne illness (Bernama, 2016a). Besides press statements made by MOH, there are articles written by reliable author *e.g.* Mr. Budiman Jaafar (an associate consultant with the Ministry of Health (MOH) Malaysia, and have been an accredited Trainers and Training Provider since year 2004) frequently wrote in the newspaper advising consumers on the causes of food poisoning mainly environment of free rodents, hygiene practices of food handlers, cross contamination (through improper food storage or bacteria from food handlers, use of separate chopping board for cooked and uncooked foods), danger of reheated foods and many more (Utusan Malaysia, 3rd November 2015). Articles or information regarding risk of food poisoning could easily be accessed in the Ministry of Health official website and social media (facebook page). This may also contribute to the reason why respondents in this study aware of the above 12 items and manage to answer correctly.

More than 50% respondents in Kuala Lumpur and Selangor did not answer correctly for items; (14) typhoid fever can be transmitted by food, (15) food prepared in advance increase the risk of food contamination, (16) microbes are in the skin, nose and mouth of healthy handlers, (17) raw vegetables are at higher risk of contamination than under-cooked beef, (18) reheating cooked foods increase the risk of food contamination, children, healthy adults, (19) freezing kills all bacteria that may cause food-borne illness, (20) *Salmonella* sp. is among the food-borne pathogens, (21) children, healthy adults, pregnant women and older individuals are at equal risk for food poisoning, (22) Hepatitis A virus is among the food-borne pathogens, (23) *Staphylococcus* sp. is among the food-borne pathogens, (24) Hot, ready-to-eat food should be kept at a temperature of 65°C and (25) the correct temperature for storing perishable foods is 5°C. Additionally, more than 50% respondents in Selangor have wrongly answered item (12) eating and drinking in the work place increase the risk of food contamination and item (13) swollen cans may contain microorganism, *Clostridium botulinum*, which causes botulism. Majority of these items relates to the relation of microbes and food preparation. This knowledge involves more scientific terms and explanation which normally being delivered to certain group of peoples i.e. those involves in food academia and research or food manufacturing/preparation industries. Perhaps for normal consumers, all kinds of food-borne pathogens are microorganisms and the fact that poor food preparation, handling and storage involve different pathogen with different degree of danger is not known.

Poor knowledge with regard to one of potential risk of food poisoning to vulnerable individuals i.e. children, pregnant women and elderly compared to healthy adults might be due to the fact that lack of information regarding that has been delivered to the public. Record of food poisoning cases has portrayed many cases involving children and elderly. To name a few, 30 food poisoning cases in year 2016 (January to August) have struck schools in Perak involving primary and secondary school children (Jamaludin, 2016). On 25th May 2016, 29 pupils of a primary school in Gua Musang, Kelantan suffered diarrhea and vomiting due to food poisoning after consumed 'Nasi Kerabu' during recess time (Bernama, 2016a). In April 2016, 34 students of a boarding school In Batu Pahat, Johor suffered food poisoning from an 'Ayam percik' meal (Chuah & Mohd Hanafis, 2016). A case awakened nation in 2013 involving a total of 170 casualties and the death of 4 individuals, who attended wedding feast in, Sungai Petani, Kedah (Embun, 2013). Two of them are senior citizens aged 56 and 62 years old and an 11 year old boy. Laboratory analysis confirmed the source of incidence was due to rotten chicken which carries *Salmonella* sp. bacteria being used in 'Ayam Masak Merah'. These incidences proved that children and elderly have a weaker or less effective immune system compared to healthy adults, which makes them more prone to food poisoning. Foods for the high risk group should always being handle with extra cautions as compared to foods for healthy adults in order to avoid unwanted consequences.

KAP studies among various consumer segments have found distinct findings. Abuga *et al.* (2017) revealed that 73.8% out of 385 household consumers in Kenya were mindful of the importance of hand washing with soap and running water before handling food, wiping clothes spread micro-organisms and reusable towels should not be used for hands. In parallel, Al-Shabib *et al.* (2017) and Courtney *et al.* (2016) recorded that consumers who are also students had good understanding of proper hand washing and cleaning kitchen surfaces and kitchen tools. In contrast, Lim *et al.* (2016) found insufficient knowledge on personal hygiene and kitchenware hygiene including proper way of hand washing to avoid food poisoning, among an island community in Sabah, Malaysia. Similarly, Lange *et al.* (2016) investigated students' knowledge and behaviour of food safety found that most students were unaware of the importance of repeated hand washing during food preparation process. Other food safety aspects which consumers were unaware of in the past studies include *i.e.* keeping cooked and uncooked food in the same container of refrigerator as well as reheating food (Courtney *et al.,* 2016), suitable temperature for growth of microorganisms (Al-Shabib *et al.,* 2017), danger to taste raw meat Lange *et al.* (2016) and storing cooked food at room temperature for more than two hours (Abuga *et al.,* 2017). These studies have been conducted in diversified countries and subjects which could contributed to distinct findings.

Comparison of consumers' attitude towards food safety in Kuala Lumpur and Selangor

Descriptive statistics consist of count, percentage, mean score and standard deviation for statements to measure consumers' attitude towards food safety is reported in Table 4 and Table 5.

Table 4 shows that generally, consumers in Kuala Lumpur and Selangor has good attitude towards food safety. This result is in line or even better than the study conducted in Haiti (Samapundo *et al.,* 2015), where 74.2% of the consumers had an adequate understanding of food safety and also Samapundo *et al.* (2016) in Vietnam where consumers portrayed good understanding of food safety (68%). Table 4 also indicates that study location is not significantly associated with consumers' level of attitudes towards food safety. Further analysis to compare mean difference of food safety attitude between two areas revealed a significant difference in the scores for food safety atttitudes among consumers in Kuala Lumpur (M=4.71, SD=0.39) and Selangor (M=4.48, SD=0.28), (t=7.085, df=414) at $p<0.05$. These results indicate that consumers in Kuala Lumpur and Selangor have similar level of food safety attitudes but their ratings differ statistically. Observations on each statement regarding attitudes towards food safety revealed diversified results, as shown in Table 5 below.

In general, Table 5 signifies that consumers in Kuala Lumpur and Selangor have positive ratings towards all statements regarding attitudes towards food safety (ratings more than 4). However,

Table 4. Consumers' Level of Attitudes towards Food Safety

Consumers' Level of Food Safety Attitudes•	Kuala Lumpur Count (%)	Selangor Count (%)	p value
Poor (rating <4)	11 (4.8)	220 (95.2)	0.349*
Good (rating >4)	6 (3.0)	194 (97.0)	

•5-point Likert scale, 1=strongly disagree, 5=strongly agree. *pearson chi square

Table 5. Mean and Standard Deviation for Consumers' Attitudes towards Food Safety

No.	Items	Kuala Lumpur Mean (Standard Deviation)	Selangor Mean (Standard Deviation)	p value	Sig.
1	Proper Hand Hygiene	4.81 (0.42)	4.52(0.50)	<0.05	S
2	Abrasions	4.80 (0.47)	4.67(0.51)		
3	Stored Separately	4.74 (0.46)	4.57(0.56)		
4	Sanitize Knife and Cutting Board	4.73 (0.53)	4.49(0.65)		
5	Separate the Raw	4.71 (0.57)	4.28(0.62)		
6	Health Status	4.71 (0.55)	4.34(0.60)	<0.05	S
7	Stored in Closed-Container	4.69 (0.55)	4.56(0.50)		
8	Wear Mask	4.69 (0.55)	4.39(0.73)		
9	Thawing of Chicken	4.69 (0.54)	4.34(0.60)		
10	Free of Contamination	4.69 (0.48)	4.51(0.52)		
11	Wear Cap	4.68 (0.54)	4.20(0.56)		
12	Used Dish Towels	4.61 (0.60)	4.56(0.57)	>0.05	NS
13	Washing the Eggs	4.61 (0.58)	4.52(0.60)		

5-point Likert scale, 1=strongly disagree, 5=strongly agree

Table 6. Consumers' Intention to Purchase Night Market Food based on Food Hygiene Practice of Food Handlers

No.	Items	Kuala Lumpur		Selangor		*p value	Sig.
		YES, n(%)	NO, n(%)	YES, n(%)	NO, n(%)		
1	Wear Gloves	227 (98.3)	4 (1.7)	197 (98.5)	3 (1.5)	>0.05	NS
2	Wear Apron	227 (98.3)	4 (1.7)	184 (92.0)	16 (8.0)	<0.05	S
3	Wear A Cap	227 (98.3)	4 (1.7)	184 (92.0)	16 (8.0)	<0.05	S
4	Safe	217 (93.9)	14 (6.1)	173 (86.5)	27 (13.5)	<0.05	S
5	Wear A Mask	214 (92.6)	17 (7.4)	173 (86.5)	27 (13.5)	<0.05	S
6	Hygienic Hands	212 (91.8)	19 (8.2)	196 (74.5)	4 (2.0)	<0.05	S
7	Packing Condition of Food	211 (91.3)	20 (8.7)	190 (95.5)	10 (5.0)	>0.05	NS
8	Method of Food Preparation	202 (87.4)	29 (12.6)	190 (95.5)	10 (5.0)	<0.05	S
9	Clean Environment	193 (83.5)	38 (16.5)	191 (95.5)	9 (4.5)	<0.05	S
10	Tasting Food using Fingers and Hand Palm	186 (80.5)	45 (19.5)	48 (24.0)	152 (7.60)	<0.05	S
11	Colour Coding Chopping Board	161 (69.7)	70 (30.3)	173 (86.5)	27 (13.5)	<0.05	S
12	Wear Nail Polish	156 (67.5)	75 (32.5)	3 (1.5)	197 (78.5)	<0.05	S
13	Internal Temperature of Meat	149 (64.5)	82 (35.5)	78 (39.0)	122 (61.0)	<0.05	S
14	Touch Cooked Food with Bare Hand	125 (54.1)	106 (45.9)	48 (24.0)	152 (7.60)	<0.05	S
15	Eating and Drinking at Workplace	87 (37.7)	144 (62.3)	36 (18.0)	164 (82.0)	<0.05	S
16	Advance Meal Preparation	81 (35.1)	150 (64.9)	19 (9.5)	181 (90.5)	<0.05	S
17	Room Temperature Food Thawing	61 (26.4)	170 (73.6)	83 (41.5)	117 (58.5)	<0.05	S

* Note: 'Yes' means respondents will consider particular aspect during purchasing of foods in night market. 'No' means respondents will not consider particular aspect during purchasing of foods in night market.
*Pearson Chi Square.
Items in highlighted rows are poor practices.

consumers in Kuala Lumpur have slightly better attitude than consumers of Selangor towards all 13-items in Table 5. It is probably because similar group of consumers have better knowledge than consumers in Selangor regarding those items as depicted in Table 3. This could be true because many studies found relationship between food safety knowledge and attitudes towards food safety (Ansari-Lari *et al.*, 2010; Abdul-Mutalib *et al.,* 2012). Items 12 and 13 are related to relation of microbes and food handling and preparation. These are the part that both group of consumers (Kuala Lumpur and Selangor) are less aware of (as in Table 3), leading to similar response of their attitudes.

Although past studies which compared consumers' KAP of food safety across area with low or high food poisoning outbreaks is limited, several studies indicated that KAP of food safety may be influenced by other factors related to available infrastructures and socio-economic of underdeveloped area. Abuga *et al.* (2017) revealed that Kenya household consumers' practice of food safety was influenced by source of water at home (either pipe in house/public stand/water vendor/ borehole) and, type of housing (i.e. permanent/semi-permanent/temporary). In addition, Lim *et al.* (2016) found that an island community in Sabah, Malaysia demonstrated poor food safety attitude regarding usage of cutting board, knife washing and storage of freshly cooked foods. This is because more than 80% respondents in their study cannot afford to possess dining table which resulted in common practice of placing cooked foods on the floor.

Comparison of consumers' intention to purchase night market food based on food hygiene practice of food handlers

In the last section of the questionnaire, respondents were asked of their intention to purchase night market food after considering 17 hygiene practices practiced by food handlers. Comparison of their intention in both locations *i.e.* Kuala Lumpur and Selangor is presented in Table 6.

Table 6 revealed that consumers in Kuala Lumpur and Selangor willing to purchase foods from stalls which the food handlers practiced a good hygiene practice except for certain practices. This indicates that most consumers were concerned of the hygienic status of food handlers. It is parallel with the results of a research done by Mojca *et al.,* (2008), where the pregnant women prefer of food handlers who had clean hands while handling food stuffs. Advices from authorities on how to choose stalls wisely as stated in press statement on 10th June 2016 in Utusan Malaysia, Datuk Seri Dr. Hilmi Yahya (Deputy Minister of Health) has clearly advised consumers to observe the hygiene practice of food handlers before buying foods due to concern of food-borne illness (Bernama, 2016b). Besides, several campaigns which have been launched by Ministry of Health in its official facebook page may provide guidance to the public in search for safe food from food premises.

Selangor consumers seem more alert and consistently observe for food handlers hygiene practices before purchasing night market foods

compared to consumers in Kuala Lumpur. In contrast, consumers in Kuala Lumpur are still willing to purchase foods from food handlers who taste food using fingers and hand palm, who wear nail polish, who touch cooked food with bare hand and did not mind if the internal temperature of food is not hot. These findings are surprising because this does not reflect initial assumption that state with low food poisoning cases will have consumers with greater knowledge on food safety. Perhaps, this could be due to majority respondents (79.2%) in Kuala Lumpur had never received formal education regarding food safety compared to only 49.5% respondents in Selangor had not. Rennie (1995) who carried out research on health education model and food hygiene education revealed that knowledge and information was prone to a change in a person' attitude and caused changes in behavior.

Apart from knowledge, consumers of night market food in the present study may regarded internal and external factor of the food itself such as taste of food, price and packaging were more important than food safety. Pannu *et al.* (2016) who carried out KAP research among customers of street food in India revealed that only 10% of respondents perceived food safety important in purchasing street food. Liu *et al.* (2014) discovered that 18% of street food consumers viewed street food they purchased as safe. In contrast, Aseigbu *et al.* (2016) indicated that about 53% respondents have some thought about food safety when buying ready-to-eat street vended food and 63% respondents disagreed that they were certain of not getting foodborne diseases when they ate ready-to-eat vended food. Despite that, 81.9% out of 402 respondents in their study regularly purchased street vended food. This is possibly because taste, affordability and accessibility were cited as reasons for purchasing ready-to-eat street foods (Liu *et al.,* 2014). Similarly, other studies recorded similar factors influencing consumers' preference in purchasing street foods in Philippines (Abdulmajid *et al.,* 2014) and in Ghana (Mensah *et al.,* 2013).

CONCLUSION

In conclusion, consumer of night market foods in Kuala Lumpur and Selangor statistically differ in terms of knowledge regarding food safety, many aspects of attitudes of food safety and intention to purchase night market food based on food hygiene practice of food handlers. This result could indicate that although both areas are close to each other, consumers were dissimilar in terms of knowledge and attitudes regarding food safety. In addition, consumers in both areas expressed intention to purchase night market foods differently towards different hygiene aspects. Food safety aspects which could be made known to consumers in both areas are those related to time and temperature abuse and food-borne pathogens.

This finding may provide baseline data for the authorities to improve food safety campaign focusing more on other aspects rather than 'hand-washing'. This research however has more rooms for improvement. Future research could be expanded to larger geographical area and bigger sample size to better comprehend wider and more segmented consumers' knowledge and attitudes towards food safety and how food safety could affect their intention and actual buying behavior. Knowing that could lead to implementing strategic framework to educate local communities to practice safe food purchasing precisely outside-home food to promote better quality of life.

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